

by the examiner's remarks in the 08/28/01 office action.

Applicant requests reconsideration of the rejections of the claims as set forth below.

35 U.S.C. § 112 REJECTIONS

Claims 8-17, 28, 32-36 and 39 were rejected under 35 U.S.C. 112 first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The examiner explains "Correlation circuit which has been claimed in Claims 8-17, 28, 32-36 and 39 do not read on figure 2". Applicant believes that it is not necessary that the correlation circuit be specifically enabled in Figure 2 as it pertains to an improved and more detailed version of the generic invention, which detailed version is shown in Figure 3. The improvements, including the various correlations of pairs of audio signals, fall within the teachings of the invention which is described with respect to Figure 2 however.

The examiner agrees that Claim 1 is generic to the (non prior art) Figures (page 14, line 9 of 10/12/00 office action)

This admission by the examiner as to Claim 1 being generic is important in respect to the Figures pertaining to commonality of any separate species, to the extent the examiner believes they exist. At MPEP 806.04(d), second paragraph, second sentence:

In general, a generic Claim ... must comprehend within its confines the organization covered in each of the species [emphasis added].

In that Claim 1 is generic, Claim 1 comprehends the organization of both Figure 2 and Figure 3. Assuming arguendo the addition of the correlation circuit in the dependent claims would create a separate species (for example as shown by Figure 3), the claims would still be allowable as stated at MPEP 806.04(d) paragraph 4:

Once a claim that is determined to be generic is allowed, all of the claims drawn

to species in addition to the elected species which include all the limitations of the generic claim will ordinarily be obviously allowable in view of the allowance of the generic claim, since the additional species will depend thereon or otherwise include all of the limitations thereof [emphasis added].

Rejected dependent Claims 8-17 inherently contain all of the limitations of generic Claims 1-3. Similarly, rejected dependent Claims 28, 32-36 and 39 inherently contain all of the limitations of Claims 20-22 which are method Claims very similar to generic Claims 1-3 and thus also generic.

Claim 39 was rejected as unpatentable under 35 U.S.C. 112, first paragraph, with respect to lack of enablement of "pitch correction". Claim 39 recites a novel combination of old elements, one of which is pitch correction. In the present invention the variable delay deals with audio signals which inherently have pitch, or frequency, characteristics. The pitch changes as the variable delay changes. U.S. Patent 5,920,842 was referenced in the specification of the present invention, (column 1, lines 19-30) as teaching pitch correction. The '842 patent teaches the above relationship between variable delays of the type used in the present invention and pitch. The '842 patent describes in detail that when there is a decrease or increase in delay, the delayed signal undergoes a corresponding change in frequency, or pitch. The '842 patent teaches how this change in frequency, or pitch, may be corrected. Claim 28 of the '842 patent specifically claims changing the delay of an audio signal while correcting pitch artifacts which occur during the varying of the time period (of the delay).

Applicant believes that the Claim 39 element "pitch correction" is an old element well known in the prior art as evidenced by the teachings of the '842 patent, and as such is adequately enabled under 35 U.S.C. 112 by the reference thereto in the present specification. Claim 39 finds novelty in the particular recited combination and cooperation of elements, each of which is individually well known in the prior art, but which combination and cooperation was previously unknown.

35 U.S.C. § 102(b) REJECTIONS

Claims 1-53 were rejected under 35 U.S.C. 102(b) as being anticipated by Kirby.

Applicant points out that Kirby has two variable delays 21 and 22 which are both responsive to the talent signal 12 and the feedback signal 14. There is no teaching in Kirby to make either delay responsive to any other signal such as the mix minus signal 34. There is no teaching in Kirby to remove either of these variable delays.

Applicant believes that the examiner has misinterpreted what one of ordinary skill in the art would know from Kirby's teachings, and accordingly submits herewith a declaration in that respect. Applicant believes claims 1-53 are allowable over Kirby for the reasons provided below.

Independent Claims 1-3 call for the feedback signal (Kirby's 14) to be applied to a combining circuit (Kirby's 40) without the use of a variable delay circuit. This is believed to be a patentable distinction over Kirby which can not operate without the variable delay 21.

Independent Claim 20 specifies that "said feedback signal is combined without additional variable delay beyond said variable amount".

Independent Claim 21 specifies that "said feedback signal receives no variable delay beyond that as part of said broadcast transmission".

Independent Claim 22 specifies that "said feedback signal suffers no variable delay beyond that as part of said broadcast transmission".

Kirby's device does not meet the limitations of Claims 20-22 because of the additional variable delay of the feedback signal by element 21. It might be noted that the claim language is not restricted to a specific instant in time, rather one of ordinary skill in the art would recognize and know that the claims pertain to the overall operation of the invention, rather than a brief selected instant of operation.

Claims 40, 43, 46, 49 and 50 all recite a parameter or adjustment in an "amount set by a human operator" which is not taught by Kirby. The examiner points the Kirby's automatically set delay 22 as being set by a human operator, but does not provide any support from Kirby's teachings for this position. Kirby's description of 22 consistently characterizes 22 (and 21) as an automatically variable delay in which the amount of delay is responsive to 10. There is no suggestion to make 22 (or 21 or 32) responsive to an operator.

Claim 5 calls for the amount of delay of the talent signal (Kirby 12) to be responsive to the mix minus signal (Kirby 34). The examiner asserts that the adaptive filter 32 is a variable delay. Applicant believes however that the adaptive filter is a fixed tapped shift register with only the multiplier coefficients of the taps being varied. This operation is taught in respect to Kirby Figures 3 and 4. Kirby's delay element for the talent signal is element 22 which is responsive to the signals 12 and 14 as measured by 10, rather than to the mix minus signal 34.

Claim 5 also calls for the amount of gain of the talent signal to be responsive to the feedback signal (Kirby 14). In Kirby, assuming *arguendo* that 32 provides gain adjustment, the amount of gain is responsive to the mix minus signal 34.

Claim 6 calls for the amount of delay and gain of the talent signal to be responsive to the feedback signal. In Kirby the amount of gain, to the extent it may be provided by 32, is responsive to the mix minus signal.

Claim 7 calls for the amount of delay and gain to be responsive to the mix minus signal. In Kirby the amount of delay is only responsive to the talent and feedback signals.

Claims 8-17, 28 and 32-36, call for a correlation circuit in various combinations which correlate the locally produced audio talent signal with the audio talent signal which is returned from the station with the correlation being in direct (comparison of talent and feedback signal) or recursive (comparison of talent and mix minus signal) form to determine or otherwise re-

spond to the delay therebetween. There is no corresponding audio delay responsive correlation circuit in Kirby. It is noted that Kirby does suggest (1st paragraph at page 4) that delay measuring system 10 may utilize "The Phase Correlation Image Alignment Method" by Kuglin and Hines, which paper shows an image or video phase alignment technique which utilizes the phase of the two images. The Kuglin & Hines paper does not enable one of ordinary skill in the art to utilize phase correlation of images for measuring the delay of audio signals, and teaches away from the use of correlation such as taught in RE 33,535 for measuring such delay.

Even assuming arguendo that Kuglin somehow enables the use of his phase correlation technique for audio signals, one of ordinary skill in the art would know that a phase measurement is not a delay measurement, as phase is a cycle to cycle characteristic which repeats as signals are offset in time. By contrast, delay is a linear measure which uniformly increases as signals are offset in time. If one measures the relative phase of two signals, it can not be known what the relative delay of the two signals is. For example if the signal period is 16 milliseconds (a typical number for images in a video signal) and the phase is 180 degrees, the delay could be any multiple of the period plus 180 degrees, i.e. 8 ms, 24 ms, 40 ms, etc.. Consequently, the Kuglin technique, even if it were to be converted to audio, is a phase measurement technique which the person of ordinary skill in the art would know is unsuitable for use as applicant's claimed delay measurement.

Applicant supplied the Kuglin and Hines paper in the August 20, 1997 response where the Kirby reference was also supplied. Applicant noted in that response that the Kuglin paper "discusses a method of accurately performing registration of fixed but displaced images, particularly in correlating displaced aerial photographs". Applicant also pointed out that it was unclear "how this paper teaches, suggests, or is even remotely related to the need to measure

delay of two similar audio signals" as in applicant's claimed invention. The examiner has not refuted this observation, and has merely rejected applicant's Claims which call for correlation of two audio signals, in respect to Kirby's patent which merely suggests the use of image registration. It is believed that one of ordinary skill in the art would be directed away from the claimed use of correlation of two audio signals by the Kuglin reference which teaches image registration techniques.

Claims 1, 5, 7 and 19 call for operator adjustment of delay or gain. The examiner has pointed to adjustment caused by the mix minus signal being fed back to the filter 32 of Kirby, however the examiner has not pointed to where an operator causes the adjustment. One of ordinary skill in the art would understand the Claim limitation of operator adjustment to refer to an adjustment by a person such as "the talent or other operator" of the device as described in the present specification, for example at the middle of page 14 of the disclosure. One of ordinary skill would not consider the automatic adjustment of 32 which is caused by the mix minus signal to be operator adjustment as claimed. The examiner has provided no indication of how Kirby's teachings would suggest otherwise.

Claims 20-22 in step d) call for combining the feedback signal with the cancellation signal without additional variable delay beyond the amount arising from its passage through a broadcast transmission. Kirby adds additional variable delay.

Claims 24 calls for varying the delay (of the talent signal) in response to the mix minus signal and varying the level in response to the feedback signal. In Kirby the delay is responsive to the talent and feedback signals.

Claim 25 calls for the level (of the talent signal) to be responsive to the feedback signal. In Kirby, to the extent that 32 adjusts the level it is responsive to the mix minus signal.

Claim 26 calls for varying the delay and level (of the talent signal) in response to the

mix minus signal. In Kirby the delay is responsive to the talent and feedback signals.

Claim 27 calls for one of the varying delay amount and the level step to be responsive to the talent signal in delayed form. In Kirby the delay is responsive to the talent signal in undelayed form and the any level adjustment by 32 is responsive to the mix minus signal.

Claim 28 calls for one of the delay or level step to be responsive to correlation of feedback and talent signal wherein the talent signal is in delayed form. Kirby's delay measurement is responsive to the undelayed talent signal. Additionally the suggested correlation is phase correlation of an image which is not a delay correlation.

Claim 29 calls for at least one of varying delay and level (of the talent signal) to be responsive to the mix minus signal and talent signal in undelayed form. In Kirby the delay is responsive to the feedback and talent signal, and any level adjustment of 32 is responsive to the mix minus signal.

Claim 31 calls for at least one of varying delay and level (of the talent signal) to be responsive to the mix minus signal and talent signal wherein the talent signal has been gain adjusted. In Kirby the delay adjustment is responsive to the unadjusted talent signal and the feedback signal. Any adjustment of the gain by 32 is responsive to the mix minus signal.

Claims 32-34 call for the correlation of signals wherein the talent signal has been gain adjusted. Kirby's delay measurement is responsive to the unadjusted talent signal and the suggested correlation is phase correlation of an image which is not a delay correlation.

Claim 38 calls for adjusting the level in response to the mix minus signal and the talent signal in delayed form. To the extent Kirby adjusts level in 32, it is in response only to the mix minus signal.

Claim 39 calls for the use of pitch correction as part of the delaying step. Kirby does not even suggest that pitch error is a problem, let alone suggest any correction.

Claims 41, 45, 47 and 51 call for the mix minus signal to intentionally include an audible residual amount of the talent signal. Kirby does not recognize that this is desirable, nor make any suggestion to achieve this feature.

Claims 42, 48, 49, 52 and 53 call for the amount of delay to be automatically changed from the amount set by the human operator to the expected amount of relative delay of the feedback signal when the relative delay changes. Kirby does not suggest any adjustment or setting by a human operator or any automatic change from such setting.

Applicant requests allowance of claims 1-53 and that the application be passed to allowance and issue.

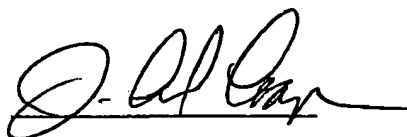
Respectfully



J. Carl Cooper

Reg. 34,568

I hereby certify this response is being facsimile transmitted to the Patent and Trademark Office (Fax No. (703) 305-3719 on October 3, 2001



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